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NEWS AND TRENDS . . .

IN CITY DEVELOPMENT

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URBAN GROWTH CHARACTERISTICS

by

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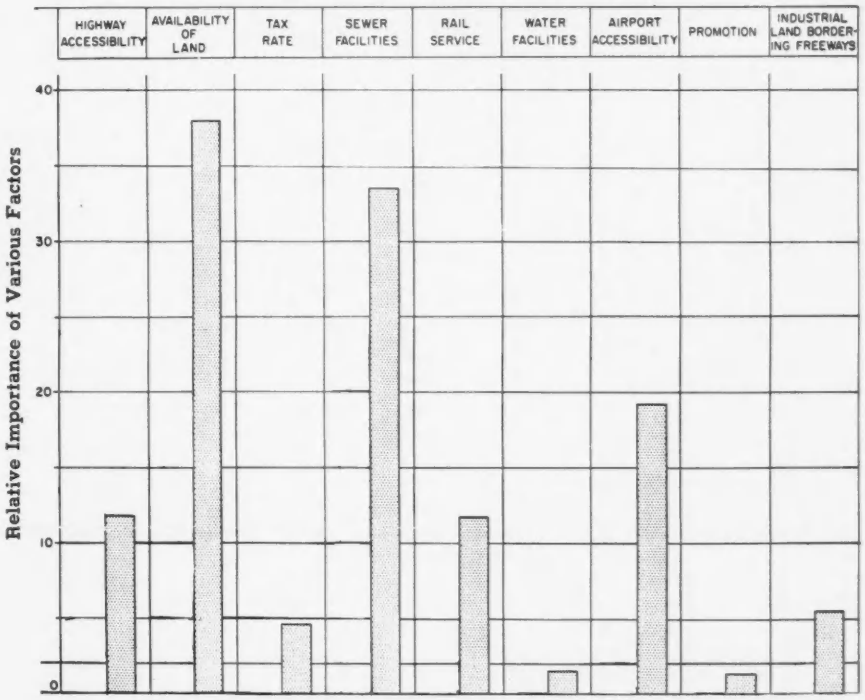
THE IMPORTANCE OF FACTORS INFLUENCING THE LOCATION OF MANUFACTURING EMPLOYMENT HARTFORD METROPOLITAN AREA



SOURCE: *Hartford Area Transportation Study, Connecticut Highway Department.*

FIGURE 1

Editor's Note

The author points out that urban growth depends upon decisions, alternatives, and timing. In making development decisions factors may be measured against the weights assigned to alternatives in choices to be made. With proper timing, urban development occurs where land is available unrestricted by former limitations in transportation. The author concludes that transportation is no longer the key factor in shaping our cities.

Alan Voorhees is a city planner formerly with The Automotive Safety Foundation. He now heads his own consulting firm, specializing in planning and urban transportation.

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Plan-itorial . . .

The Role of Public Transportation in Preservation of Open Space

The old-fashioned city, which was a densely populated district surrounded by farms, belongs to the period of Grandma Moses' antique American landscapes.

It has been displaced by the metropolitan area which in its simplest form is a compact vertical central city, swaddled in depth by miles of horizontal suburban development. In many parts of this country, and particularly along the Atlantic Coast between Boston and Washington, whole chains of metropolitan areas now have been fused; so that a person may travel from the heart of one city to the heart of another without ever emerging from a congealed mass of suburbs. Open country has disappeared and almost all space has been filled with settlement.

Our Metropolitan Jumble

While individual subdivisions may be skillfully planned, any semblance of coordination in the total assembly of metropolitan developments is likely to be purely accidental, if it exists at all.

Transportation is throttled except where rail lines were built decades ago or where express highways recently have been constructed at fantastic costs.

Now, it is precisely within the choked and cluttered space of metropolitan areas that population increase in America concentrates its pressure. We are predominantly an urban rather than a rural people.

The twin trends toward more people and less open space in metropolitan areas compound congestion, skyrocket public budgets, and exhaust the patience of the average citizen who must circulate to live.

In a modern community, jobs, homes, stores, service facilities, and recreational centers are so widely dispersed that mechanized transportation vehicles of one sort or another are absolutely necessary to tie things together. We can't walk from place to place; distances are too great.

We have reached the point where just the plain lack of space for new roads threatens communities with civic arteriosclerosis. Yet the free flow of circulation is now more imperative than ever.

In very large measure the present congestion of metropolitan space is due to the fact that just when our population explosion really went into high gear the current fad for horizontal suburban living reached peak level. Suburban population densities run about ten to twenty persons per acre in contrast to vertical city concentration of fifty to two hundred per acre, or more.

The combination of rapid population increases and suburban dispersion consumes a lot of space and it consumes it with startling speed.

Most important of all, this space consumption takes place right in the metropolitan areas where lack of open land quickly becomes the critical factor that limits easy circulation.

Horizontal Suburban Growth

The present sequence of community growth defies logic. Space is available in superabundant quantity before settlement sprawls. At that stage space is not especially valuable and no one thinks very highly of it. Then, when settlement has become widespread and space for circulation is needed, it seems to have disappeared. This is of course the reverse of what should be true for community health. When a community becomes settled, then is when it should have an abundance of space for the transportation arteries it will need.

Under the present system of horizontal suburban growth, the space elimination process goes on about five to ten times faster than it did under the old-fashioned system of vertical city growth.

(*Continued on Page 6*)

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ULI'S CENTRAL CITY COUNCIL

Central City Council is the name by which ULI's Central Business District Council is now to be known, following a meeting of the Council's Executive Group in Miami, Florida, on November 9. The change in name was made to more accurately describe the scope and interest of the Council's expanding activities.

In every city the central area is much more than a downtown business district. It is the core for everything that furnishes and serves the urban concentration. In the central city problems are complex and hard to solve. Yet the functioning of the central city is vital to the entire metropolitan area. Thus, "Central City" better reflects the full range of activity and work by this Council of Urban Land Institute.

New Officers and Trustees of ULI

Joseph W. Lund of Boston, was elected as the twelfth president of the Urban Land Institute, at the annual meeting of its Board of Trustees held in Miami Beach on November 12, 1961 in the Fontainebleau Hotel. He succeeds Boyd T. Barnard of Philadelphia.

Other 1962 officers elected were: first vice president, Urban A. Denker of Wichita; second vice president, F. Poche Waguespack of New Orleans; secretary, Waverly Taylor of Washington, D. C.; and treasurer, H. Walter Graves of Philadelphia.

William F. Keesler, senior vice president of the First National Bank of Boston, was newly-elected to a three year term as a member of the ULI Board of Trustees.

Re-elected as trustees for three year terms were: Urban A. Denker, Wichita; Carl R. Dortch, Indianapolis; James B. Douglas, Seattle; H. Walter Graves, Philadelphia; John B. Hollister, Detroit; Henry S. Miller, Jr., Dallas; Leonard P. Reaume, Detroit; Charles B. Shattuck, Los Angeles; Harley L. Swift, Harrisburg; Howard J. Tobin, Milwaukee; and R. L. Yowell, Schenectady.

Credit: Fabian Bachrach

JOSEPH W. LUND, *President*
R. M. Bradley & Co., Inc.
Boston, Massachusetts
President, Urban Land Institute

Mr. Lund, president of R. M. Bradley & Company, Inc., one of the largest general realty firms in New England, has served the Urban Land Institute as a vice president and as vice chairman of its Central Business District Council. He has served as president of the National Association of Real Estate Boards and of the Boston Real Estate Board.

Mr. Lund was chairman of the Boston Redevelopment Authority from its formation in 1957 until April 1961. He is president of the National Association of Real Estate Investment Funds, which was organized in November 1960, after Congress passed the new real estate Investment Trust Act. He graduated from Harvard in 1926, and has been associated with the Bradley firm since 1934. He has participated in ULI panel studies of Fairless Hills, Denver, St. Louis, Grand Rapids, and Cincinnati.

URBAN GROWTH CHARACTERISTICS

by

ALAN M. VOORHEES, President
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New techniques have been developed to analyze growth characteristics of urban areas. These techniques have been applied in ten American cities—Hartford, Baltimore, Washington, and a group of Iowa cities including Des Moines, Sioux City, Council Bluffs, Waterloo, Cedar Rapids, Dubuque, and Davenport.

Although these communities may not be truly representative of all American cities, the findings show that former concepts of urban development are rapidly changing, along with social, economic, and technological changes, particularly as they relate to our rising standard of living.

The exact pattern of growth that materializes in a community is the result of many individual decisions — a manufacturer decides where to locate his next plant, a merchant decides which of his stores to expand, a government agency decides where to relocate, a family decides where to rent or buy a house. The final choice in all such cases depends upon the alternatives available at any given time.

In making such decisions many factors are weighed. For example, among other factors, a family will consider type, size and kind of house, financial cost arrangements, neighborhood amenities, distance to stores and schools, accessibility to jobs, and adequacy of governmental service.

The studies undertaken in the ten cities measured the importance people place on these and other factors in making their locational decisions. Though different individuals may weigh the same factors differently, on a group basis the most significant factors can be defined and measured. From the analysis, it was possible to develop mathematical formulas to indicate what weight people give to the various factors of location.

Use of Formulas

In addition to serving as an analytical device to appraise past growth trends, formulas have other advantages. They can be used to estimate the potential impact of public policies or decisions. Thus a formula can be used to help predict a pattern of growth that will be brought about by different urban plans or highway programs, as well as the influence that zoning plans might exert on urban growth. Cities like Hartford, Washington, and Baltimore have been employing such formulas to evaluate alternative schemes of land development.

Usually four or five formulas are developed to reflect aspects of urban growth. For example, in the Hartford area separate formulas were used to

analyze manufacturing service and retail employment, as well as population.

To establish past growth trends of manufacturing employment in the Hartford area, nine variables were used in the analysis. The variables considered were highway accessibility, availability of industrial land, tax rate, sewer and water service, rail service, proximity of industrial land to airports, size of existing industrial activities, and promotional aspects.

With highway accessibility, tax rate, and proximity to airports, a quantitative measurement was fairly easy. However, for such things as promotional aspects subjective evaluations were necessary to develop a rating index.

The influence that the several variables had on urban growth was appraised by multiple correlation. In effect, a formula was developed by multiple correlation analysis which would give a growth index for a particular zone. This growth index, when compared with the sum of the indices for all the zones, reflects the amount of the growth that can be expected in a zone anticipating a certain amount of overall growth.(1) (2) (3)

Figure 1 shows the results of the multiple correlation analyses. The height of the bar represents the relative importance of the various factors considered. To make it possible to compare the importance of the various factors, all the parameters were adjusted so that their values ranged between 0 and 50.

This test indicated that the most important factors were *available land* and *sewer service*. Next in order of importance were accessibility to airport, highway access, and rail service. The other factors were of relatively minor significance in influencing community growth. Because this information can be of considerable value to developers and planners, a summary is presented based on the findings derived from these ten cities.

Population Patterns

In reviewing population and residential growth trends, the studies recognized that if builders are to build for the low-cost homes market, they must search for low-priced land. Doubtless, low land costs are probably the most influential factors affecting urban growth. The analysis in these cities reveals that, other things being equal, an area having low-priced land may develop up to three or four times as fast as it theoretically should, on the basis of accessibility and availability of land. Evansdale, Iowa, a small incorporated area outside Waterloo, grew at a rapid rate during the last decade because of inexpensive land. The pattern changed abruptly when FHA withheld mortgages in the town because of sewer problems.

However, as people rise in the income scale they tend to place more emphasis on the type of area in which their home is located. They ask: Is it an attractive neighborhood? Are the public services such as schools and police protection adequate? Does the locality have any claim to distinction as a "prestige area?" Areas that meet these tests grow nearly twice as fast as those which do not. Notable examples of phenomenal growth of prestige areas are found in Montgomery County, Maryland, northwest of Washington, D. C. and in the Towson area, north of Baltimore.

But, as already indicated, there are many other elements involved in the rate of growth of a residential area. Lack of sewer or water service, for example, can hold growth rates to about one-third of normal, everything else being equal. An example of this is the southeast section of the Washington Metropolitan area. Otherwise attractive areas where land owners are deferring sale of property for tax advantages, or for capital gains, often have only half the growth that might be anticipated. A good example of this is Suffield, Connecticut, a town north of Hartford near the state line. This factor is much more prevalent than one might expect, particularly in the large metropolitan area.

Nevertheless, one of the prime growth factors is the availability of land. The extent and intensity of its use, of course, depend upon the zoning policy for the area.

Although accessibility of an area is an important consideration for a family, a family weighs other factors that have been cited. Most sections in a metropolitan area are served by highways. The difference in accessibility as between one place and another may be only a few minutes. Hence it is apparent that transportation facilities and services do not now exert the dominant influence on urban growth as formerly. *The automobile has freed the family transportation-wise so that it can afford to weigh other factors in the selection of a home.*

Employment Patterns

In considering the spatial distribution of employment, it was recognized that different types of work activities place varying emphasis on locational factors. Therefore, the various categories of employment were grouped by locational requirements in the studies cited here.

Manufacturing

As in residential selection, the employer in his choice of plant location also has been freed by the automobile. He now knows that he can locate a plant almost any place within an urban region and be assured of the necessary labor force. In short, today accessibility to the labor force is not the important factor to industrialists or other employers as in the past. More often the chief concern is in a specific site requirement such as water, sewer, freeway, port or rail service.

In the Baltimore area most of the largest manufacturing industries have gravitated to the corridor lying to the east and northeast of Baltimore City which has good rail and highway access as well as accessibility to water.

Only a few manufacturing activities are attracted to residential areas. Usually these are light industries looking for "prestige sites," as is particularly true in the area north of Baltimore where a number of smaller industrial plants have located. Overall, however, five-sixths of the industrial expansion that occurred in the Baltimore region was influenced largely by site requirements. Only one-sixth of the expansion was influenced primarily by the residence of population.

The studies also revealed a definite tendency for existing large employment centers to draw new industrial activities to their general vicinity. Similarly, greater growth was evidenced where there were promotional programs for industrial land development.

Certainly the availability of rail, port, and highway played a part in the location of some manufacturing plants. Areas with relatively low residential prestige often provided land to industrial developers at a price they could afford and, as a result, these areas had considerable growth. However, if the

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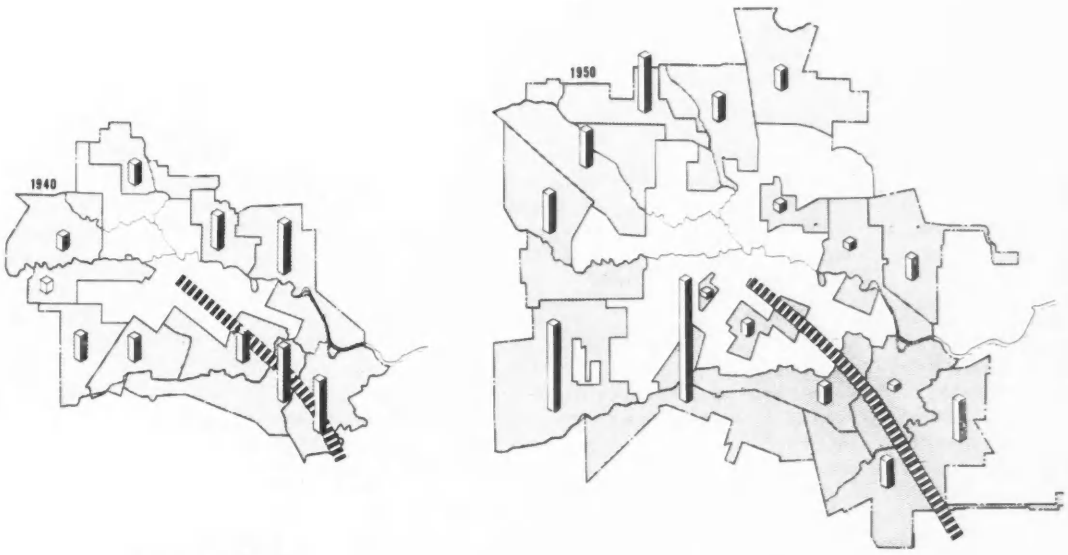
[1] Charles F. Barnes, "Integrating Land Use and Traffic Forecasting," Highway Research Board, Washington, D. C., 1961.

[2] Rex H. Wiant, "A Simplified Method For Forecasting Urban Traffic," Highway Research Board, Washington, D. C., 1961.

[3] *Baltimore-Washington Interregional Study*, Baltimore Regional Planning Council & National Capital Regional Planning Council, November 1960.

HOUSTON POPULATION INCREASES ..... 1940 - 1957



1940 - 1950 1950 - 1957

THE GULF FREEWAY

SOURCE: *Houston Planning Commission*

FIGURE 2

parcels of available land in such areas were too small, the growth was retarded.

An interesting sidelight in these studies is that industrialists are more interested in the capacity of the sewer system than in the cost of connecting to it. On the other hand, home builders are more interested in the cost of sewer service.

Retail

Retail employment trends in the study cities changed quite apparently with the changing pattern of population. As the families shifted to the suburbs, the neighborhood retail trade went along. However, retail expansion generally follows the first wave of residential development. Retailers like to have an "insured" market before they move out. The exact location of the store will depend largely upon the accessibility factors.

The exact location of shopping centers and other commercial activities is largely dictated by street patterns. Most merchants want the point of highest accessibility. In various analyses made in these studies it was quite clear that commercial development will shift with changes in accessibility. For example, some of the older out-lying shopping areas were located at junctions of fairly narrow streets. When new and wider streets were built, new commercial areas developed along the new routes.

With the development of freeways in the area, the new commercial establishments located near the junctions of the freeways. Often these commercial areas were within a short distance of each other. All of these shifts were brought about by changes in the heightened level of transportation service, which in effect influenced the relative accessibility of the specific areas.

Shopping center location is also influenced by the accessibility factor. The location and size of existing centers have marked impact upon the location of new centers. Generally a new center is apt to locate within three or four miles of an existing center which does not have an adequate range of merchandise. But the pace of residential development will determine whether the old center is expanded or a new one is developed.

Other Employment

Service activities, such as dry cleaning outlets, hairdressers, banks, etc., have followed a pattern similar to that of retail establishments. They have moved to the suburbs to be closer to the people and industries they serve. Certain types of activity, however, still find the downtown area very attractive. These are organizations that depend upon accessibility to a large labor

pool or specialize in certain lines. For example, in Baltimore the Commercial Industrial Trust located in the downtown area mainly because it needed a large pool of office workers. On the other hand, some of the more or less standardized office operations which do not require large labor forces will locate in the suburbs.

Governmental

In studying the location choice pattern for many governmental activities in the Washington area, it was clear that a strictly personal decision by the head of the agency was often involved. However, different factors of influence were noted. First, accessibility to the labor force is important. Thirty per cent of the governmental expansion between 1948 and 1957 occurred in the downtown area.

Certain governmental activities concentrate in outlying suburban zones where other governmental activities have already been located. On the basis of the analysis made in the study, nine zones in the suburban area received more than their share of growth.

In addition to increase in the number of Federal employees, an increase in employment by local governments took place. Most of this growth followed changes in population, since a large portion of it was aimed at serving the new people.

In general, the study has shown that many of the changes in employment patterns have followed population adjustments. Almost all retail and service employment has shifted with population. Many governmental and office activities have moved out to be closer to the people they serve. In effect, about two-thirds of the employment follows the migrating population.

Transportation No Longer Key Factor

The most important conclusion to be drawn from these studies is that transportation is **not** the key factor in shaping our cities today. With the universal use of the automobile and the development of metropolitan area street systems, the urban dweller has been given almost unlimited latitude in where to live or locate his business. Because of this, he gives considerable attention to factors other than transportation in making a final decision.

At first glance, this conclusion seems to be at odds with other recent research. For example, the Bone and Wohl study[4] of the industrial expansion along Route 128 outside Boston has indicated that transportation was a very important factor in this growth. These results were based largely upon attitudes expressed by industrialists who have located along this freeway.

However, a further look at the replies by these industrialists reveals that they also were giving weight to other factors such as the attractiveness of the area and its advertising value. Though many of them did say that "commercial access" was very important to them, the fact remains that they could have obtained practically the same commercial access if they located one or two miles away from the expressway. A few minutes of travel would not have made that much difference.

Certainly the fact that the firm of Cabot, Cabot & Forbes was promoting the area along Route 128 increased its growth potential. In fact, the area along the route was not developing until Cabot, Cabot & Forbes were able to convince the first industrialist to locate along the route. The first venture began the wave of development found there today. The fact that industrialists follow "fads" just as people do was observed in most of the cities that were studied.

This would also hold with regard to the accessibility to the labor force. Perhaps, if overall employment patterns in the Boston area were analyzed, the findings would be similar to those found in the ten cities, mentioned earlier.

Also often cited, when discussing the influence of freeways on urban development, is the great expansion of residential development that occurred near the Gulf Freeway in the southeast section of Houston.[5] It is true that when this facility was first opened there was a tremendous growth in its vicinity for a period of about five years. (See Figure 2.) However, recent growth trends in the Houston area have swung to the southwest portion of the city, which is generally considered the prestige area. Furthermore, a new freeway has been built whch serves a rather rundown section of Houston. This has had no apparent influence on the growth patterns.

Such illustrations show that the dynamic factors in urban growth must be considered together. When a change in transportation facilities is introduced it may modify the influence of the other factors. Improved accessibility, particularly at the beginning of a new development, if combined with other favorable factors may stimulate a great deal of growth. But, as in Houston, the other factors, like blight, may become dominant, and changes in accessibility are not enough to really stimulate growth.

Decisions, Alternatives, and Time

All of this tends to emphasize the basic point brought out at the beginning of this paper—namely, that urban growth depends not only upon many individual decisions, but on the alternatives offered at the time the decisions are made. If the expansion of large electronic activities in the Boston area had occurred before Route 128 was developed, these industries would have located in some other place. If Route 128 were being built today, it might not attract anywhere near the number of firms it has attracted there because the industries might not see the site advantages in the same light today that they did a few years ago. Urban growth is sensitive to many factors modified by time.

In conclusion, this point should be strongly emphasized: It is quite obvious from the analysis of growth patterns in the ten American cities that our standard of living is becoming a major factor in our development patterns. The individual, whether home owner or industrialist, is becoming more and more concerned with other factors besides transportation. This change must be recognized in urban plans.

PLANITORIAL

(*Continued from Page 2*)

Open Space Disappears

I don't think the American public is aware of how rapidly the disappearance of space has accelerated in recent years. I don't think people are aware of what that disappearance means in terms of efforts to introduce some sense of order into schemes for community growth and public circulation in the formative stages before it is too late. They know they spend more dollars for less results, but I don't think they know that more and more of those dollars are simply going down the drain to pay for buildings that later are

[4] A. J. Bone and Martin Wohl, *Massachusetts Route 128 Impact Study*, Highway Research Board Bulletin 227.

[5] *Economic Evaluation of the Gulf Freeway*, City of Houston Department of Traffic and Transportation, July 1949.

blasted out of the way so land can be recovered on which roads may be built.

Communities need space-saving accounts just as people need ordinary money savings accounts to tide them over when the going gets rough. Communities will have to start putting land in space banks just as citizens put money in savings banks. The community which lacks a sense of thrift in this respect may be compared to the shiftless individual who spends today without thought of tomorrow.

Density and Transportation

At Levittown, Long Island, population density is about eighteen persons per acre. In Manhattan's residential neighborhoods, it averages between three hundred and five hundred per acre. A bus would have to travel between sixteen and twenty-seven miles in Levittown to pick up as many passengers as it would in one mile in Manhattan. Obviously, one way to compensate for low patronage per mile is to run fewer buses per day, hoping that passengers will pile up. However, the waiting interval may become so long that many suburbanites will abandon public transportation entirely. This puts more personal cars on the road and adds to traffic congestion on main arteries.

No company can afford to provide cheap efficient transportation service in the face of dispersed settlement and poor patronage.

The development of apartment house suburbs with increased population densities per acre along shorter routes of travel could revive economical public transportation. The alternatives seem to be either more private cars and roads to accommodate them, or various forms of subsidized public transportation.

Now it should be understood by the public that the subsidies are not for the benefit of the transportation companies, to cover up their supposed inefficiencies; but rather such subsidies are just another of the extra penalties that people must pay to live dispersed in horizontal suburbs.

Transportation and Civic Geometry

Public transport that pays its own way developed in vertical cities and connected vertical cities. It depended upon mass patronage. Suburbia with its dispersed populations does not provide mass patronage. Transportation economics is very closely related to civic geometry. In our usual pursuit of wishful thinking we seem inclined to defy the mathematics of space and time in our search for adequate transportation systems.

Quite a few calculations have been made as to how much space is necessary to convey people from place to place in private cars as compared with rapid transit. It seems a single lane of street, subject to cross traffic in front and marginal friction along the sides, will allow about sixteen hundred persons in private automobiles to pass a given point in one hour. Trains running on a single track, whether above or below ground, can carry from forty thousand to sixty thousand persons per hour depending on whether they run as locals or expresses.

Translated into space requirements, these figures are staggering. A single railroad track, used for trains that stop briefly every half to three-quarters of a mile, is worth twenty-five lanes of ordinary street. A single railroad track, used for trains that stop briefly every one to three miles, is worth twenty-three lanes of turnpike or elevated express highway. To replace one double-tracked railroad entering a city would require forty-six lanes of Chinese Walls.

It would be amusing to contemplate, if the situation were not so tragic, why it is that cities literally perform harikari by ripping open their bowels with elevated highways at fabulous cost while railroads, which already have rights-of-way into the hearts of cities, go out of the passenger business. It is the consequence of deliberate high-level decisions to stifle a tax-paying private industry into submission, while substituting for it a colossal tax-supported public-spending program which can never transport people as efficiently and will always lag behind in the provision of service that gullible motorists have been led to expect, but never get.

Of course railroads lose their attraction when settlement in the suburbs becomes so widely scattered that it takes a private car to get to a depot. That is not the fault of the railroads. Again, it is the consequence of the modern trend to disperse settlement anywhere and everywhere that the FHA guarantees the mortgage.

Washington and Urban Affairs

When Washington talks about urban affairs and pronounces what it calls a new enlightened doctrine of complete community planning, one wonders if it intends to re-examine the policy of its own mortgage insurance agencies to see what might be done to introduce some design and discipline into the shaping of the modern metropolitan landscape. Certainly, the loose thinking of the FHA in the past has been one of the prime promoters of present environmental sprawl in suburbs. An enlightened policy at the sensitive level where credit is granted or refused could do wonders toward bringing the metropolitan landscape out of its present state of shock.

Of course, such drastic action would kick the bottom out of a lot of land speculation, but is that too stiff a price to pay for reasonable public budgets, reduced bond issues, and community designs that would restore life to public rapid transportation?

Traffic and Population Congestion

Traffic congestion is the first serious symptom of a coming population congestion. If the inanimate machine cannot be handled efficiently, then there can be little hope of accommodating properly the droves of self-willed humanity that are in the offing. That is the really frightening aspect of today's highway problem. It is a severe test of man's capacity to organize space for the population crush that lies ahead.

It would be folly to think that management of hordes of people is something that government eventually could solve easily. The highway problem has revealed how weak and inept government is when it comes to planning the use of space.

It is patently unfair of government to blame the private land owner for slum conditions in housing or industry, as is done in many cities, when government sets the pace by the creation of slum streets and slum highways and refuses to set neighborhood standards of quality through zoning.

It will be impossible for highway supply ever to get ahead of demand if our public engineers continue to recommend and build the kind of uncontrolled-access roads which they know are a waste of money and space—because they become obsolete before they are finished.

Impacts on Environment

As populations multiply in cities, the outlying farms will continue to ship them food, but the rural countryside will never be able to send gift packages

of space to relieve the congestion that is certain to smother metropolitan districts to an extent and intensity far beyond present imagining.

In Suburbia, wherever open land is still available, very wide rights-of-way for future controlled-access highways should be purchased so that the private automobile can still be used for some decades if people prefer. However, even in Suburbia, greater human densities must be expected ultimately. Then it will be necessary to convert parts of these rights-of-way to public rapid transit.

One of the obvious sacrifices in living standards that everyone will have to make in the future, as human densities increase, will be a restricted use of the private automobile.

To tear down tax-paying structures in cities just to keep building more elevated roads at up to thirty-three million dollars a mile, as it is now proposed to do in lower Manhattan, is fiscal madness. The time has come for the engineering profession not only to examine the quality of the individual projects it designs but to weigh as well the probable impact of such projects upon the total environment.

Preventive Engineering

There is a need in our society for a type of preventive engineering which could do for the metropolitan landscape what preventive medicine does to avoid the spread of epidemic diseases. We have had enough of civic surgery by engineers who specialize in the technique of the scalpel. It is time we encouraged a different breed who could plan the development of a community so as to avoid trouble in the first place. It is a function of the human mind to anticipate trouble and to warn the body of danger. The engineer should perform a similar function for the well-being of the modern metropolis.

Space Is Not a Commodity

Cities will never worm their way out of their present dark labyrinth of confusion as long as they are under the hypnotic spell of public road officials, bridge and tunnel authorities, or street and traffic departments which are top-heavy with designers who relish multi-million-dollar solutions to vehicular congestion that should never have been allowed to develop in the first place. It is the job and everlasting pride of project authority bureaucrats to solve the impossible, even though the impossible could be avoided entirely with ordinary horse sense.

Is it possible for America to look upon space not as a commodity for speculation and trade, but rather as the one precious, absolutely limited, irreplaceable, and non-transferable element of our habitat?

Of all the substances that go to make up a metropolitan environment, the square miles it occupies are its most vital possession. How that space is used will affect the lives of generations. It will influence the vitality of commerce, the cultural level of the people, the tax rate, and the general quality of daily living.

Political administrations can be changed by elections. Old buildings can be replaced with new ones. But space cannot be stretched, exchanged, shrunk, or moved. What a community does with this one ingredient of its existence will affect its vigor, utility, communications, and beauty for all human time.

As I see it, this is the challenge that lies before us—those of us engaged in the problems of urban development, and those charged with the public responsibility of guiding our urban affairs into a more sensible form and pattern than has yet been evident.

Edward Higbee, Professor of Geography, University of Delaware and author of The Squeeze: Cities Without Space, *published by William Morrow & Company, New York, 1960.*

This paper was delivered by Dr. Higbee at the panel discussion "The Developer's Stake in Transportation" on the occasion of ULI's Tri-Council meeting in Philadelphia, May 17, 1961.

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Housing and Economic Progress: A Study of the Housing Experiences of Boston's Middle-Income Families. Lloyd Rodwin. Published for the Joint Center for Urban Studies by Harvard University Press and the Technology Press of the Massachusetts Institute of Technology, Cambridge, Mass. 1961. 228 pp., tables, charts, appendices. $7.50.

The author believes that today's housing problems are mainly caused by inadequate ability to supply homes for middle-income families, whose increasing prosperity is resulting in more rapid family growth and a demand for the higher standards of space, quality, and environment they can now afford. To illustrate this thesis, he has chosen Boston for intensive study. Boston was selected because it could furnish excellent records, particularly state and federal reports; and being an older city, it was well suited for historical analysis.

Much of the data presented in tables and charts dates from 1879, or earlier, down to 1959; a long period in which to trace trends. Significant aspects of housing are explored, such as the role of building and loan associations and of dreary and inflammable wooden three-decker development; the impact of government policies on housing tenure and rent control; and the effects of economic progress on the changing house and neighborhood. Also some widely accepted views are challenged, among them the customary identification of housing problems solely with slums, poverty, and the low-income groups.

This book provides the first systematic analysis of the housing experiences of middle-income families.

Methods of Regional Analysis: An Introduction to Regional Science. Walter Isard, with 6 associate authors. John Wiley and Sons, Inc., 440 4th Ave., New York (co-published by The Technology Press, Cambridge, Mass.). 1960. 784 pp. $9.50.

As a compendium of information on regional analysis, this book is amply illustrated with charts, diagrams, maps, and mathematical formulas. Methods of dealing with population migration, population projection, regional economic analysis, and gravity models are discussed. This work is a basic resource for the technician in urban economics.